

**WHAT IS CLAIMED IS:**

1. A method for transmitting security data between an OLT (Optical Line Termination) and a destination user in an EPON (Ethernet Passive Optical Network) system having a plurality of ONUs (Optical Network Units) connected to a plurality of users and  
5 the OLT the method comprising the steps of:
  - a) creating a transmission frame comprised of a data field for encrypting the security data, a key information field for storing key information used for decrypting the encrypted data of the data field, and a security frame having an ONU ID field for indicating ONU ID information identified by an ONU with the destination user and a user ID field for  
10 indicating a security ID identified by the destination user; and
  - b) transmitting the transmission frame.
2. The method as set forth in claim 1, wherein the security frame further includes a designator field for storing information of a group of the ONUs and the users.
3. The method as set forth in claim 1, wherein the security frame further includes a  
15 MDF (Management Defined Field) for storing MIB (Management Information Base) information and associated protocol information.

4. The method as set forth in claim 1, further comprising the step of:

c) transmitting the transmission frame to the users connected to the ONUs for identifying the ONU ID field contained in the security frame of the transmitted frame.

5. The method as set forth in claim 1, further comprising the steps of:

5        selecting at least one user who can identify contents of the ONU ID field contained in the security frame from among the plurality of users connected to the ONUs for identifying the ONU ID field, and transmitting the transmission frame to the selected user.

10